

Application No.: 09/525,898
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REMARKS

Claims 1-2, 4-14 and 17-31 remain pending in the application, with claims 1 and 9-11 having been previously withdrawn. Claim 2 has been amended without introduction of new matter. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

The indication that claim 8 defines patentable subject matter is noted with appreciation.

Claims 2, 4, 12, 17, and 19 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite period this rejection is respectfully traversed.

The Office notes that claim 2, line 3, recites "at least one code is never used for transmitting signals", and objects that "if the code is never used, how can the receiver 'estimate said interference... using said... code'". In response, it is pointed out that claim 2 does not state that the code is never used. What claim 2 defines is that "said at least one code is never used *for transmitting signals*." (Emphasis added.) Claim 2 then further defines "receiving a composite signal; and estimating said interference *at a receiver* using said at least one reserved code." Applicant can find no contradiction in specifying that a code is not to be used for transmitting, but that it may be used as part of a receiving process (i.e., for purposes of interference estimation). Accordingly, no amendment to claim 2 is believed to be necessary.

The Office further objects that "'signals' should be further defined." Applicant respectfully disagrees, but in the interest of expediting favorable prosecution has now amended the preamble of claim 2 to define "a method for estimating interference in a radio communication system" to even more clearly define the context in which the word "signals" is used. In this context, "signals" is a well-known term of art that does not require further definition. See, for example, the very art cited and applied by the Office in the Action: Wichman (US 6,665,334) uses the word "signal" in a similar manner, such as 3, lines 14-16 where it is stated, "When sending the *signals*, the base station has multiplied a *signal* intended for each terminal by a spreading code used in the connection concerned." (Emphasis added.) Accordingly, no amendment is believed to be necessary to address the Office's concern.

In view of the foregoing, it is believed that the claims define the invention with sufficient particularity and distinctness to satisfy the requirements of the statute. It is

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therefore respectfully requested that the rejection of claims 2, 4, 12, 17, and 19 under the second paragraph of 35 U.S.C. §112 be withdrawn.

Claims 2, 4-7, 12-14, 17-24, and 27-29 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Wichman et al. (U.S. Patent No. 6,665,334). This rejection is respectfully traversed.

The various embodiments defined by these claims all relate to interference estimation in a Code Division Multiple Access (CDMA) communication system. In such a system, interfering signals are allowed to share the same frequency at the same time. This is achieved by, on the transmitter side, multiplying each signal with a unique spreading code sequence. The signals are then scrambled and transmitted on the common channel in overlapping fashion as a composite signal. Each mobile receiver correlates the composite signal with a respective unique despread code sequence to thereby extract the signal addressed to it. See, for example, pages 1-2 in Applicant's specification.

One characteristic of such a system is that signals that are not addressed to a mobile receiver assume the role of interference. To achieve reliable reception of a signal, the ratio of the signal to the interference should be above a prescribed threshold for each mobile station (referred to as a required signal-to-interference ratio, or SIR_{req}). Being able to accurately measure the level of interference that occurs concurrently with the desired signal is, therefore, very important in CDMA systems because that measurement forms the basis for any of a number of different power control mechanisms that are employed to make sure that each signal contributing to the composite signal is transmitted at neither too strong nor too weak a power level.

The Background section of Applicant's disclosure describes a number of known techniques for measuring the interference. One of these, referred to as "a third method", is described on page 6, lines 16-24 as follows:

A third method ... involves correlating the received signal with the channelization code allocated to the connection during a time when nothing is being transmitted to the mobile station. Since there is no "wanted" signal, despread the received signal would then yield a good estimate of the interference. A problem with this approach is that the mobile station has to know when no information is being transmitted to it. This could be solved by

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having predetermined time-instants of no transmission, but such a solution has a certain capacity loss, since the interference measurement would need to be updated quite regularly.

Applicant's methods and apparatuses for estimating interference take an entirely different approach. In embodiments defined by independent claim 2, a method for estimating interference comprises the steps of "reserving at least one code in a set of codes for interference measurement only; receiving a composite signal; and *estimating said interference at a receiver using said at least one reserved code.*" (Emphasis added.)

Each of independent claims 5, 21, 22, and 27 similarly defines reserving a code that is used only or primarily for estimating interference associated with a received signal.

It is well known that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). In the present instance, independent claims 2, 5, 21, 22, and 27 are not anticipated by Wickman et al. at least because Wickman et al. fail to disclose or even suggest reserving at least one code in a set of codes only (or primarily) for interference measurement, and then using that reserved code to estimate interference in the composite signal.

Wickman et al. does not appear to be concerned with estimating interference. Instead, the Wickman et al. patent describes techniques for *canceling* the effect of interfering signals from a desired signal. (See, e.g., the Abstract of Wickman et al.) In order to do this, the receiver first estimates the number of signals and the codes that are used. (See, e.g., Wickman et al. at column 3, lines 47-54.) Once the codes associated with interfering signals are identified, the interfering signals are detected and removed from the received signal by means of known methods of interference cancellation. (See, e.g., Wickman et al. at column 5, lines 29-31.)

Thus, the Wickman et al. patent fails to anticipate Applicant's claims at least because it neither discloses nor suggests "reserving at least one code in a set of codes for interference measurement only *such that said at least one code is never used for transmitting signals*; receiving a composite signal; and *estimating said interference at a receiver using said at least*

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one reserved code." To the contrary, Wickman et al.'s technique relies only on codes that *are* used for transmitting signals. (See, e.g., Wickman et al. at column 3, lines 35-37.)

In support of its rejection, the Office argues that, regarding claim 2, "figure 3 discloses a receiver for receiving a composite signal comprising a desired signal and plurality of interfering signals each associated with a predetermined code (reserving at least one code)..." The Office's very argument, then, confirms that Wickman et al. disclose predetermined codes being reserved *for use by the interfering signals*. This is directly counter to Applicant's claimed subject matter, which defines the reserved code as being one that, for example, "is never used for transmitting signals." If the code is never used for transmitting signals, it could not be reserved for use by the interfering signals as required by Wickman et al.

For at least the foregoing reasons, independent claims 2, 5, 21, 22, and 27, as well as the dependent claims 4, 6-7, 12-14, 17- 20, 23-24, and 28-29 are believed to be patentably distinguishable over the Wickman et al. patent. Accordingly, it is respectfully requested that the rejection of claims 2, 4-7, 12-14, 17-24, and 27-29 under Section 102(e) be withdrawn.


Claims 25, 26, 30, and 31 stand rejected under 35 USC §103(a) as allegedly being unpatentable over Wickman et al.. This rejection is respectfully traversed.

Claims 25, 26, 30, and 31 variously depend from independent claims 22 and 27, and are therefore patentably distinguishable over the Wickman et al. patent for at least the same reasons as those set forth above. It is therefore respectfully requested that the rejection of claims 25, 26, 30, and 31 under Section 103(a) be withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,
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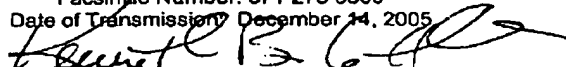
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